

REMARKS

Claims 1-4 and 13-16 are pending. Claims 13-14 represent the semiconductor device described in the second embodiment as shown in FIGS. 6-8 without restrictions added to amended claim 1. Claims 15-16 contain the same matter as canceled claims 5-8.

Regarding Claim Rejections - 35 U.S.C. §102

Claims 1-4 stand rejected under 35 U.S.C. §102(b) as being clearly anticipated by *Kepler et al.* (U.S. Patent 6,037,671).

Kepler et al. discloses alignment marks being divided by a line-and-space pattern. The Office Action points out coincidences between the present invention according to claims 1-4 and the alignment marks disclosed in *Kepler et al.* However, *Kepler et al.* does not disclose all the features of the present invention, and patentability of the present invention is not denied due to the existence of *Kepler et al.* as described in detail below.

The present invention according to claims 1-4 has the features that the micronized pattern dividing the alignment marks has a size smaller than a resolution limit of an alignment sensor, and that the micronized pattern has a pattern forming margin larger than that of a device pattern formed over the semiconductor wafer. The alignment mark divided in this way enables FIA (Field Image Alignment) signal waveforms to have a high contrast with little deformation, which leads to high alignment accuracy, and prevents generation of pattern defects. The alignment mark in the present invention is divided by the micronized pattern in terms of adjustment of signal waveforms used for alignment sensing.

To the contrary, *Kepler et al.* discloses neither the relationship between a size of the micronized pattern and a resolution limit of the alignment sensor, nor the relationship between pattern forming margins of the micronized pattern and the device pattern. Moreover, in *Kepler et al.*, alignment marks are divided by a micronized pattern for the purpose of providing a uniform topography, which enables deposition of a transparent layer without steps and local planarization. The division of alignment marks in *Kepler et al.* is dominated by such a topographical factor, and no alignment mark is disclosed in *Kepler et al.* that is divided in terms of adjustment of signal waveforms used for alignment sensing. Therefore, *Kepler et al.* completely differs from the present invention according to claims 1-4 regarding the basis for dividing alignment marks.

In addition, the alignment mark described in claims 3 and 4 corresponds to that described by way of an example in the second embodiment as shown in FIGS. 6-8. Since previous expressions of claims 3 and 4 might lead to misunderstanding of the Examiner, claims 3 and 4 are amended so as to make this point clear as shown above.

Kepler et al. discloses only alignment marks divided by line-and-space pattern, but does not disclose any alignment mark divided by the line-and-space pattern in which each of a number of lines constituting the line-and-space pattern are divided into a plurality of segments. Therefore, it is clear that the present invention according to claims 3 and 4 are completely different from *Kepler et al.* and thus is not anticipated by *Kepler et al.*

The same argument as discussed concerning claims 3 and 4 applies to newly added claims 13 and 14 and it is therefore also clear that claims 13 and 14 are not anticipated by *Kepler et al.*

It is well settled that:

"A claim is anticipated only if each and every element *as set forth in the claim* is found, either expressly or inherently described, in a single prior art reference." *Constant v. Advanced Micro-Devices, Inc.*, 848 F.2d 1567, 7 USPQ2d 1057 (Fed. Cir. 1988)."

Should the Office continue to believe that independent claims 1-4 and 13-14 are anticipated by the asserted prior art, a citation of where each and every claimed feature, either as column number and line number, or figure number and reference numeral, or a combination thereof, as disclosed in the asserted prior art is respectfully requested. Should the Office determine that any claimed feature is not disclosed in the asserted prior art, it is respectfully submitted that the claimed invention is not anticipated by the asserted prior art. Allowance of the claimed invention is then respectfully requested.

Regarding Claim Rejections - 35 U.S.C. §103

Claims 5-8 are rejected under 35 U.S.C. §103(a) as being unpatentable over *Kepler et al.*, as applied to claims 1-4 and further in view of *Hwang et al.* (U.S. Patent 6,162,675).

Claims 5-8 are canceled since the matter contained in claims 5-8 is combined into amended claim 1. The following is the verification that amended claims 1-4 and newly added claims 15 and 16 are not rejected under 35 U.S.C. §103(a) as being unpatentable over *Kepler et al.* and further in view of *Hwang et al.*

As described above, *Kepler et al.* discloses neither the relationship between a size of the micronized pattern and a resolution limit of the alignment sensor, nor the relationship between pattern forming margins of the micronized pattern and the device pattern. In addition, alignment marks in *Kepler et al.* are divided by a micronized pattern for the purpose of providing a uniform topography. Namely, alignment marks in *Kepler et al.* are divided on the basis completely different from the present invention according to claims 1-4.

Therefore, even when *Hwang et al.* discloses a DRAM cell with a plurality of gates, it is impossible for even one of ordinary skill in the art to establish such a design rule or way as applied to the above-mentioned alignment marks described in claims 1-4.

Claims 15 and 16 are dependent from any one of claims 13 and 14, and *Kepler et al.* completely differs from the present invention according to claims 13 and 14 as mentioned above. Therefore, it is clear that the present invention according to claims 15 and 16 would have been unobvious to one of ordinary skill in the art at the time the invention was made, even if the arts disclosed in *Kepler et al.* and *Hwang et al.* were combined.

CONCLUSION

In view of the aforementioned amendments and accompanying remarks, claims 1-4, as amended herein, and new claims 13-16 are believed to be patentable and in condition for allowance, which action, at an early date, is requested.

If, for any reason, it is felt that this application is not now in condition for allowance, the Examiner is requested to contact Applicants undersigned attorney at the telephone number indicated below to arrange for an interview to expedite the disposition of this case.

In the event that this paper is not timely filed, Applicants respectfully petition for an appropriate extension of time. Please charge any fees for such an extension of time and any other fees which may be due with respect to this paper, to Deposit Account No. 01-2340.

Respectfully submitted,

ARMSTRONG, WESTERMAN & HATTORI, LLP



Michael N. Lau
Attorney for Applicant
Reg. No. 39,479

MNL/nrp
Atty. Docket No. **020171**
Suite 1000
1725 K Street, N.W.
Washington, D.C. 20006
(202) 659-2930



23850

PATENT TRADEMARK OFFICE